



Common Market for Eastern and Southern Africa



EDICT OF GOVERNMENT



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COMESA 229-2-2 (2006) (English/French): Plugs and socket-outlets for household and similar purposes. Part 2: Particular requirements for socket-outlets for appliances



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COMESA HARMONISED
STANDARD

COMESA/DHS
229-2-2: 2005

**Plugs and socket-outlets for household and
similar purposes. Part 2: Particular
requirements for socket-outlets for appliances**

REFERENCE: DHS 229-2-2: 2005

Foreword

The Common Market for Eastern and Southern Africa (COMESA) was established in 1994 as a regional economic grouping consisting of 20 member states after signing the co-operation Treaty. In Chapter 15 of the COMESA Treaty, Member States agreed to co-operate on matters of standardisation and Quality assurance with the aim of facilitating the faster movement of goods and services within the region so as to enhance expansion of intra-COMESA trade and industrial expansion.

Co-operation in standardisation is expected to result into having uniformly harmonised standards. Harmonisation of standards within the region is expected to reduce Technical Barriers to Trade that are normally encountered when goods and services are exchanged between COMESA Member States due to differences in technical requirements. Harmonized COMESA Standards are also expected to result into benefits such as greater industrial productivity and competitiveness, increased agricultural production and food security, a more rational exploitation of natural resources among others.

COMESA Standards are developed by the COMESA experts on standards representing the National Standards Bodies and other stakeholders within the region in accordance with international procedures and practices. Standards are approved by circulating Final Draft Harmonized Standards (FDHS) to all member states for a one Month vote. The assumption is that all contentious issues would have been resolved during the previous stages or that an international or regional standard being adopted has been subjected through a development process consistent with accepted international practice.

COMESA Standards are subject to review, to keep pace with technological advances. Users of the COMESA Harmonized Standards are therefore expected to ensure that they always have the latest version of the standards they are implementing.

This COMESA standard is technically identical to the International Standard *IEC 60884-2-2:1989*.

<p>A COMESA Harmonized Standard does not purport to include all necessary provisions of a contract. Users are responsible for its correct application.</p>
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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

60884-2-2

Première édition
First edition
1989-08

**Prises de courant pour usages domestiques
et analogues –**

**Partie 2-2:
Règles particulières pour les socles pour
appareils d'utilisation**

**Plugs and socket-outlets for household
and similar purposes –**

**Part 2-2:
Particular requirements for socket-outlets
for appliances**



Numéro de référence
Reference number
CEI/IEC 60884-2-2: 1989

Numéros des publications

Depuis le 1^{er} janvier 1997, les publications de la CEI sont numérotées à partir de 60000.

Publications consolidées

Les versions consolidées de certaines publications de la CEI incorporant les amendements sont disponibles. Par exemple, les numéros d'édition 1.0, 1.1 et 1.2 indiquent respectivement la publication de base, la publication de base incorporant l'amendement 1, et la publication de base incorporant les amendements 1 et 2.

Validité de la présente publication

Le contenu technique des publications de la CEI est constamment revu par la CEI afin qu'il reflète l'état actuel de la technique.

Des renseignements relatifs à la date de reconfirmation de la publication sont disponibles dans le Catalogue de la CEI.

Les renseignements relatifs à des questions à l'étude et des travaux en cours entrepris par le comité technique qui a établi cette publication, ainsi que la liste des publications établies, se trouvent dans les documents ci-dessous:

- «Site web» de la CEI*
- **Catalogue des publications de la CEI**
Publié annuellement et mis à jour régulièrement (Catalogue en ligne)*
- **Bulletin de la CEI**
Disponible à la fois au «site web» de la CEI* et comme périodique imprimé

Terminologie, symboles graphiques et littéraux

En ce qui concerne la terminologie générale, le lecteur se reportera à la CEI 60050: *Vocabulaire Electrotechnique International* (VEI).

Pour les symboles graphiques, les symboles littéraux et les signes d'usage général approuvés par la CEI, le lecteur consultera la CEI 60027: *Symboles littéraux à utiliser en électrotechnique*, la CEI 60417: *Symboles graphiques utilisables sur le matériel. Index, relevé et compilation des feuilles individuelles*, et la CEI 60617: *Symboles graphiques pour schémas*.

* Voir adresse «site web» sur la page de titre.

Numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series.

Consolidated publications

Consolidated versions of some IEC publications including amendments are available. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Validity of this publication

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology.

Information relating to the date of the reconfirmation of the publication is available in the IEC catalogue.

Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is to be found at the following IEC sources:

- **IEC web site***
- **Catalogue of IEC publications**
Published yearly with regular updates (On-line catalogue)*
- **IEC Bulletin**
Available both at the IEC web site* and as a printed periodical

Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

* See web site address on title page.

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES

Part 2: Particular requirements for
socket-outlets for appliances

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This publication has been prepared by Sub-Committee 23B: Plugs, socket-outlets and switches, of IEC Technical Committee No. 23: Electrical accessories.

The text of this publication is based upon the following documents:

Six Months' Rule	Report on Voting	Two Months' Procedure	Report on Voting
23B(C0)70	23B(C0)84	23B(C0)86	23B(C0)94

Full information on the voting for the approval of this publication can be found in the Voting Reports indicated in the above table.

This Part 2 shall be used in conjunction with IEC Publication 884-1 (first edition, 1987): Part 1: General requirements. It lists the changes necessary to convert that publication into the IEC standard: Particular requirements for socket-outlets for appliances (first edition).

In this publication:

- 1) The following print types are used:
 - requirements proper: in roman type;
 - *test specifications: in italic type;*
 - explanatory matter: in smaller roman type.
- 2) Sub-clauses and figures which are additional to those in Part 1 are numbered starting from 101.

The following IEC publications are quoted in this standard:

Publications Nos. 320 (1981): Appliance couplers for household and similar general purposes.

320-2-2: Part 2: Interconnection couplers for household and similar equipment (being printed).

760 (1983): Flat, quick-connect terminations.

PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES

Part 2: Particular requirements for
socket-outlets for appliances

INTRODUCTION

Clauses of Part 1 are declared as applicable when they contain requirements concerning socket-outlets for appliances.

1. Scope

This clause of Part 1 is applicable except as follows:

Addition:

This standard applies to socket-outlets integrated or intended to be incorporated in or fixed to appliances (hereinafter referred to as "socket-outlets for appliances").

Addition after the last explanation:

Socket-outlets for appliances are provided with means for fixation into appropriate mounting boxes, if intended also for use in fixed installations.

The socket-outlets referred to are intended to be used in stationary equipment and appliances such as office machines, computers, audio-visual and video equipment, range hoods, ranges, etc.

If necessary, the use of socket-outlets for appliances is indicated in the standards for the appropriate equipment or appliance.

This standard does not apply to the socket-outlets for appliances covered by IEC Publication 320 and its amendments (and defined as "interconnection couplers") for which the requirements of IEC Publication 320-2-2 apply for the time being.

2. Definitions

This clause of Part 1 is applicable except as follows:

2.6 *Replacement:*

A *socket-outlet for appliances* is a socket-outlet integral with, or intended to be incorporated in, or fixed to, an electrical appliance.

Additional definitions:

- 2.101 A *flat, quick-connect termination* is an electrical connection consisting of a male tab and female connector which can be readily inserted and withdrawn without the use of a tool

Other terms, such as: "snap-on connector", "flat push-on connector" are sometimes used.

- 2.102 A *female connector* is the part of a flat, quick-connect termination intended to be permanently attached to a conductor.

- 2.103 A *male tab* is the part of a flat, quick-connect termination intended to be permanently attached to an accessory.

3. General requirements

This clause of Part 1 is applicable.

4. General notes on tests

This clause of Part 1 is applicable except as follows:

Additional sub-clause:

- 4.101 If the socket-outlet for appliances is provided with male tabs of quick-connect terminations, new female connectors shall be used for each test according to Clauses 18, 19 and 20.

These female connectors shall be made from unplated copper alloy.

5. Ratings

This clause of Part 1 is applicable except as follows:

5.1 Addition:

For socket-outlets for appliances Table I applies up to and including a rated current of 16 A and up to and including a rated voltage of 250 V.

6. Classification

This clause of Part 1 is applicable except as follows:

6.2.1.1 Addition:

For unenclosed socket-outlets for appliances, protection against electric shock may be provided by the appliance in which the socket-outlet is intended to be mounted.

7. Marking

This clause of Part 1 is applicable except as follows:

7.1 *Addition:*

In addition, socket-outlets for appliances provided with flat, quick-connect terminations and screw-type or screwless terminals shall be supplied with an instruction sheet, attached to the smallest packaging unit, informing the user that flat, quick-connect terminations shall not be used for fixed installations.

8. Checking of dimensions

This clause of Part 1 is applicable.

9. Protection against electric shock

This clause of Part 1 is applicable.

10. Provision for earthing

This clause of Part 1 is applicable.

11. Terminals

This clause of Part 1 is applicable except as follows:

11.1.1 *Addition after the first paragraph:*

Socket-outlets for appliances shall be provided with screw-type terminals, screwless terminals and/or male tabs of flat, quick-connect terminations.

11.2.1 *Addition after the explanation to Table III:*

The terminals of socket-outlets for appliances need not have the possibility of looping-in.

Additional sub-clause:

11.101 *Flat, quick-connect terminals*

Male tabs and female connectors to be used for test purposes shall comply with IEC Publication 760.

11.101.1 *Constructional requirements*

11.101.1.1 *Male tabs shall be of nominal sizes:*

2.8 mm x 0.8 mm

4.8 mm x 0.8 mm

6.3 mm x 0.8 mm

as detailed in IEC Publication 760.

Male tabs of other dimensions and shapes may be used provided it is not possible to insert them into female connectors intended to fit the above male tab sizes.

Compliance is checked by measuring three samples, all of which shall comply with the requirements.

Round dimple indents, rectangular dimple indents, hole indents or provisions for non-reversible flat quick-connect terminations, if any, shall also comply with IEC Publication 760.

11.101.1.2 Male tabs shall be made from copper or copper alloy (bare or tin plated). Materials or coatings other than those specified may be used, provided that their electrical and mechanical characteristics are no less reliable, particularly with regard to resistance to corrosion, stability of contact resistance and mechanical strength.

11.101.1.3 Male tabs shall have adequate strength to allow the application and removal of female connectors without damage to the socket-outlet so as to impair compliance with this standard.

Compliance is checked by applying, without jerks, axial forces equal to those shown in Table 101.

No displacement or damage shall occur which might impair further use.

TABLE 101

Forces to be applied to tabs

<i>Male tab size</i>	<i>Push¹⁾</i>	<i>Pull¹⁾</i>
<i>mm</i>	<i>N</i>	<i>N</i>
2.8 x 0.8	50	40
4.8 x 0.8	60	50
6.3 x 0.8	80	70
¹⁾ <i>These values are the maximum allowed for the insertion and removal of a female connector into and from a male tab.</i>		

11.101.1.4 Male tabs shall be adequately spaced to allow the connection of the appropriate female connectors.

Compliance is checked by applying an appropriate female connector to each male tab; during this operation no strain or distortion shall occur to any of the tabs or to their adjacent parts, nor shall the creepage distance or clearance be reduced below those specified in Clause 26.

11.101.2 Electrical requirements

11.101.2.1 Male tab sizes shall be related to the rated current of the socket-outlet as shown in Table 102.

TABLE 102

Relationship between tab size and rated current

Male tab size mm	Maximum rated current A
2.8 x 0.8	6
4.8 x 0.8	10
6.3 x 0.8	16

12. Construction of fixed socket-outlets

This clause of Part 1 is applicable except as follows:

12.21 Replacement:

Socket-outlets for appliances shall be so designed that the assembling of their component parts is not affected by the fixation of the socket-outlet to the appliance.

The method of fixing shall be such that the socket-outlet cannot turn and cannot be detached from the appliance without the aid of a tool.

13. Construction of plugs and portable socket-outlets

This clause of Part 1 is applicable.

14. Interlocked socket-outlets

This clause of Part 1 is applicable.

15. Resistance to ageing, to harmful ingress of water and to humidity

This clause of Part 1 is applicable.

16. Insulation resistance and electric strength

This clause of Part 1 is applicable.

17. Operation of earthing contacts

This clause of Part 1 is applicable.

18. Temperature rise

This clause of Part 1 is applicable.

19. Breaking capacity

This clause of Part 1 is applicable.

20. Normal operation

This clause of Part 1 is applicable.

21. Force necessary to withdraw the plug

This clause of Part 1 is applicable.

22. Flexible cables and cords and their connection

This clause of Part 1 is applicable.

23. Mechanical strength

This clause of Part 1 is applicable, except as follows:

Addition:

- *for socket-outlets for appliances Sub-clause 23.101.*

Additional sub-clause:

- 23.101** *Socket-outlets for appliances are checked by applying blows to the sample by means of the spring-operated impact-test apparatus shown in Figure 101 and described below.*

All surfaces which are accessible when the socket-outlet for appliance is mounted as in normal use are tested with the above test apparatus.

Socket-outlets integral with or designed to be incorporated in an appliance are tested as in normal use.

Socket-outlets designed to be fixed to an appliance are mounted on a vertical sheet of plywood 8 mm thick and 175 mm square without any metallic back plate, the plywood being mounted on a rigid frame which is fixed to a solid wall of brick, concrete or the like.

Blows are applied to all accessible surfaces, the test apparatus being calibrated to deliver an energy corresponding to that delivered by the striking element of the pendulum, as shown in Figures 17, 18, 19 and 20 of Part 1.

For all such surfaces three blows are applied to each of the three weakest points (maximum nine blows).

The following energy values of the spring hammer are considered as corresponding to those delivered by the pendulum.

Pendulum: height of fall cm	Spring hammer: energy J
7,5	0,17 ± 0,05
10	0,22 ± 0,05
15	0,33 ± 0,05
20	0,44 ± 0,05
25	0,55 ± 0,05

Care is taken that the results from one series of three blows do not influence subsequent series. If there is doubt as to whether a defect has been caused by the application of preceding blows, this defect is neglected and the group of three blows which led to the defect is applied to the same place on a new sample, which shall then comply with the test.

After the test, the samples shall show no damage within the meaning of this standard: in particular, live parts shall not become accessible to the standard test finger.

Damage to the finish, small dents which do not reduce creepage distances or clearances below the values specified in Sub-clause 26.1 and small chips which do not adversely affect the protection against electric shock or harmful ingress of water are neglected.

Cracks not visible with normal or corrected vision, without additional magnification, and surface cracks in fibre-reinforced mouldings and the like, are ignored.

Cracks or holes in the outer surface of any part of the socket-outlet are ignored if the socket-outlet complies with this standard even if this part is omitted.

The apparatus used for the test consists of three main parts: the body, the striking element and the spring-loaded release cone. The body comprises the housing, the striking element guide, the release mechanism and all parts rigidly fixed thereto. The mass of this assembly is $(1\,250 \pm 10)$ g. The striking element comprises the hammer head, the hammer shaft and the cocking knob. The mass of this assembly is (250 ± 1) g.

The hammer head has a hemispherical face of radius 10 mm and is made of polyamide having a Rockwell hardness of HR 100.

The cone has a mass of 60 g, and the cone spring exerts a force of approximately 5 N when the release jaws are on the point of releasing the striking element. The release mechanism springs are adjusted so that they exert a force just sufficient to keep the release jaws in the engaged position.

The tripping force required to release the striking element shall not exceed 10 N. The configuration of the hammer shaft, the hammer head and the means for the adjustment of the hammer spring is such that the hammer spring has released all its stored energy approximately 1 mm before the tip of the hammer head passes the plane of impact.

For the last millimetre of its travel prior to impact, the striking element shall be, apart from friction, a freely-moving mass having only kinetic energy and no stored energy. Moreover, after passing the phase of impact, the striking element shall be free to travel without interference over a further distance of at least 8 mm.

The apparatus is cocked by pulling the cocking knob until the release jaws engage with the groove in the hammer shaft.

The blows are applied by pushing the release cone against the sample in a direction perpendicular to the surface of the point to be tested.

The pressure is slowly increased so that the cone moves back until it is in contact with the release bars, which then move to operate the release mechanism and allow the hammer to strike.

24. Resistance to heat

This clause of Part 1 is applicable.

25. Screws, current-carrying parts and connections

This clause of Part 1 is applicable.

26. Creepage distances, clearances and distances through sealing compound

This clause of Part 1 is applicable except as follows:

26.1 Addition:

Socket-outlets for appliances are tested with the metal frame, if any, placed in the most unfavourable positions if this frame, acting as a support, is movable.

27. Resistance of insulating material to abnormal heat, to fire and to tracking

This clause of Part 1 is applicable.

28. Resistance to rusting

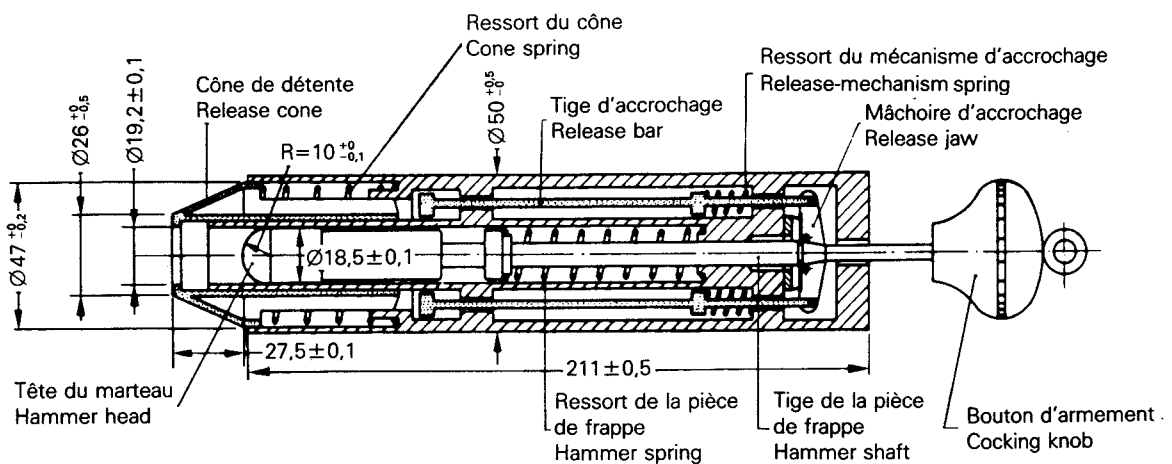
This clause of Part 1 is applicable.

29. Additional tests on pins provided with insulating sleeves

This clause of Part 1 is applicable.

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Dureté Rockwell HR 100
 Dimensions en millimètres

Rockwell hardness HR 100
 Dimensions in millimetres

FIG. 101. - Appareil d'essai de choc à ressort.
 Spring-operated impact test apparatus.

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